Wherefore, what is claimed is:

1. A computer-implemented process for generating a video having interactive water effects, comprising using a computer to perform the following process actions:

inputting an image of a scene;

generating a reflection copy of the scene depicted in the input image to create a water region image;

merging the input image and water region image, and sizing the merged image to fit a desired frame size, to produce a first frame of the video;

distorting the water region portion of the merged image to simulate at least one ripple originating at a site selected by a viewer; and

generating a sequence of additional frames, each of which comprises a distorted version of the water region of the immediately preceding frame in which any ripple simulated in the immediately preceding frame is shown in a new location that simulates the natural motion of a ripple across a surface of a body of water.

2. The process of Claim 1, wherein the process action of merging the input image and the water region image comprises the actions of:

disposing the input image in the upper portion of the merged image; and

disposing the water region image in the lower portion of the merged image with an upper edge thereof placed adjacent to a lower edge of the input image such that the water region image is oriented so as to appear as an upside down copy of the input image.

3. The process of Claim 2, wherein the process action of creating the water region image comprises an action of applying a reflection attenuation factor to the reflection copy of the input image which has the effect of obscuring the depicted scene.

4. The process of Claim 3, wherein the process action of applying the reflection attenuation factor comprises an action of scaling down the intensity of each pixel in the water region image by an amount specified by the factor.

5. The process of Claim 3, wherein the degree to which the depicted scene is obscured by application of the reflection attenuation factor is selected by a user generating the interactive water effects video.

6. The process of Claim 1, wherein the process action of distorting the water region portion of the merged image to simulate at least one ripple originating at a site selected by a viewer, comprises the actions of:

establishing a height map comprising a plurality of points each of which is assigned a height value and each of which corresponds to a different location of the water region portion of the merged image;

displaying the merged image to the viewer and inputting the location of each site selected by the viewer in the water region of the merged image;

imposing a ripple mask onto the height map established for the merged image by modifying the assigned height values of the points thereof corresponding to each viewer-selected location of the merged image, as well as height map points corresponding to locations of the merged image adjoining the viewer-selected locations;

computing new image coordinates for each location in the water region of the merged image that correspond to a height map point using the height map values associated with each of said locations; and

moving a pixel or pixels associated with each of said locations to the new image coordinates.

7. The process of Claim 6, wherein the process action of establishing a height map, comprises an action of establishing a separate height map point for each pixel of the water region portion of the merged image.

8. The process of Claim 6, wherein the process action of imposing a ripple mask onto the height map established for the merged image, comprises, for each viewer-selected location of the merged image, the actions of:

adding a height value representing a ripple amplitude of the ripple being simulated to the existing height value assigned to the height map point corresponding to the viewer-selected location;

adding a height value representing one-half of the ripple amplitude to the height map points corresponding to locations of the merged image above, below, to the right and to the left of the viewer-selected location; and

adding a height value representing one-quarter of the ripple amplitude to the height map points corresponding to locations of the merged image directly diagonal to the viewer-selected location.

9. The process of Claim 8, wherein the ripple amplitude is a negative height value so as to simulate an object dropping into the water so as to cause a localized depression in the surface of a body of water.

10. The process of Claim 9, wherein the height value associated with the ripple amplitude is selected by the viewer for each viewer-selected location of the merged image.

11. The process of Claim 6, wherein the process action of computing new image coordinates for each location in the water region of the merged image that correspond to a height map point, comprises, for each such location, the actions of:

subtracting the height value assigned to the height map for the merged image location to the left of the location under consideration from the

height value assigned to the height map for the merged image location to the right of the location under consideration, and dividing the resulting difference by a scaling factor that relates the scale of the height map values to the merged image, to compute a horizontal translation value for the merged image location under consideration;

subtracting the height value assigned to the height map for the merged image location directly above the location under consideration from the height value assigned to the height map for the merged image location immediately below the location under consideration, and dividing the resulting difference by the scaling factor, to compute a vertical translation value for the merged image location under consideration;

adding the horizontal translation value to the horizontal image coordinate of the merged image location under consideration to establish a new horizontal image coordinate for the location; and

adding the vertical translation value to the vertical image coordinate of the merged image location under consideration to establish a new vertical image coordinate for the location.

12. The process of Claim 1, wherein the process action of generating a sequence of additional frames, comprises, for each new frame, the actions of:

computing a new height map for the frame being generated from the height map associated with the immediately preceding frame;

computing new image coordinates for each location in the water region of the frame being generated that correspond to a height map point using the new height map values associated with each of said locations; and

moving a pixel or pixels associated with each of said locations to the new image coordinates.

13. The process of Claim 12, wherein the process action of computing a new height map for the frame being generated, comprises, for each height map point, the actions of:

summing the height values assigned to points in the height map associated with the immediately preceding frame that correspond to locations of said preceding frame which are directly above and below, and directly to the left and to the right, of the location associated to the height map point under consideration;

dividing the height value sum by two to compute a height value quotient;

subtracting the height value assigned to the height map point under consideration in the height map associated with the immediately preceding frame from the computed height value quotient to produce a new height value for the height map point under consideration; and

assigning the new height map value to the height map point under consideration.

14. The process of Claim 12, wherein the process action of computing a new height map for the frame being generated, comprises, for each height map point, the actions of:

summing the height values assigned to points in the height map associated with the immediately preceding frame that correspond to locations of said preceding frame which are directly above and below, and directly to the left and to the right, of the location associated to the height map point under consideration;

dividing the height value sum by two to compute a height value quotient;

subtracting the height value assigned to the height map point under consideration in the height map associated with the immediately preceding frame from the computed height value quotient to produce a resultant height value for the height map point under consideration;

applying a damping factor to the resultant height value to produce a damped resultant height value, wherein the application of the damping factor

reduces the resultant height value to simulate a smoothing out of the ripple or ripples over time; and

assigning the damped resultant height value to the height map point under consideration.

15. The process of Claim 14, wherein the process action of applying the damping factor, comprises the action of:

multiplying the resultant height value by a fractional number representing the damping factor to produce a damping value; and

subtracting the damping value from the resultant height value to produce said damped resultant height value.

16. The process of Claim 14, wherein the damping factor is selected by the viewer.

17. The process of Claim 12, wherein the process action of computing new image coordinates for each location in the water region of the frame being generated that correspond to a height map point using the new height map values associated with each of said locations, comprises, for each such location, the actions of:

subtracting the height value assigned to the height map for the location of the new frame to the left of the location under consideration from the height value assigned to the height map for the location of the new frame to the right of the location under consideration, and dividing the resulting difference by a scaling factor that relates the scale of the height map values to the new frame, to compute a horizontal translation value for the location of the new frame under consideration;

subtracting the height value assigned to the height map for the location of the new frame directly above the location under consideration from the height value assigned to the height map for the location of the new frame immediately below the location under consideration, and dividing the resulting

difference by the scaling factor, to compute a vertical translation value for the location of the new frame under consideration;

adding the horizontal translation value to the horizontal image coordinate of the location of the new frame under consideration to establish a new horizontal image coordinate for the location; and

adding the vertical translation value to the vertical image coordinate of the location of the new frame under consideration to establish a new vertical image coordinate for the location.

18. The process of Claim 12, further comprising a process action of distorting the water region portion of the frame being generated to simulate at least one new ripple originating at a site selected by a viewer.

19. The process of Claim 18, wherein the process action of distorting the water region portion of the frame being generated to simulate at least one new ripple, comprises the actions of:

displaying the immediately preceding frame to the viewer and inputting the location of each site selected by the viewer in the water region of said preceding frame; and

imposing a ripple mask onto the new height map computed for the frame being generated by modifying the assigned height values of the points thereof corresponding to each viewer-selected location of the merged image, as well as height map points corresponding to locations of the frame being generated which adjoin the viewer-selected locations.

20. The process of Claim 19, wherein the process action of imposing a ripple mask onto the height map computed for the frame being generated, comprises, for each viewer-selected location of the frame being generated, the actions of:

adding a height value representing a ripple amplitude of the ripple being simulated to the existing height value assigned to the height map point corresponding to the viewer-selected location;

adding a height value representing one-half of the ripple amplitude to the height map points corresponding to locations of the frame being generated above, below, to the right and to the left of the viewer-selected location; and

adding a height value representing one-quarter of the ripple amplitude to the height map points corresponding to locations of the frame being generated directly diagonal to the viewer-selected location.

21. A system for generating a video having interactive water effects, comprising:

a general purpose computing device;

a computer program comprising program modules executable by the computing device, wherein the computing device is directed by the program modules of the computer program to,

input an image of a scene;

generate a reflection copy of the scene depicted in the input image to create a water region image;

merge the input image and water region image, and sizing the merged image to fit a desired frame size, to produce a first frame of the video;

distort the water region portion of the merged image to simulate at least one ripple originating at a site selected by a viewer;

further distort the water region portion of the merged image to simulate a periodic wave; and

generate a sequence of additional images, each of which comprises a distorted version of the water region of the immediately preceding frame in which each ripple and the periodic wave simulated in the immediately preceding frame is shown in a new location that simulates the natural motion of a ripple and wave across a surface of a body of water.

22. The system of Claim 21, wherein the program module for distorting the water region portion of the merged image to simulate a periodic wave, comprises sub-modules for:

establishing a height map comprising a plurality of points each of which is assigned a height value and each of which corresponds to a different location of the water region portion of the merged image;

generating periodic wave height values for each height map point which simulate the shape and location of a wave on the surface of a body of water at a given point in time;

computing new image coordinates for each location in the water region of the merged image that correspond to a height map point using the height map values and periodic wave height values associated with each of said locations; and

moving a pixel or pixels associated with each of said locations to the new image coordinates.

23. The system of Claim 22, wherein the sub-module for computing new image coordinates for each location in the water region of the merged image that correspond to a height map point, comprises, for each such location, comprises sub-modules for:

adding the height value assigned to the height map for the merged image location to the left of the location under consideration to the periodic wave height value generated for the same location and associated with said given point in time to produce a combined left-side neighbor height value;

adding the height value assigned to the height map for the merged image location to the right of the location under consideration to the periodic wave height value generated for the same location and associated with said given point in time to produce a combined right-side neighbor height value;

subtracting the combined left-side neighbor height value from the combined right-side neighbor height value, and dividing the resulting difference

by a scaling factor that relates the scale of the height map values to the merged image, to compute a horizontal translation value for the merged image location under consideration;

adding the height value assigned to the height map for the merged image location directly above the location under consideration to the periodic wave height value generated for the same location and associated with said given point in time to produce a combined upper neighbor height value;

adding the height value assigned to the height map for the merged image location immediately below the location under consideration to the periodic wave height value generated for the same location and associated with said given point in time to produce a combined lower neighbor height value;

subtracting the combined upper neighbor height value from the combined lower neighbor height value, and dividing the resulting difference by the scaling factor that relates the scale of the height map values to the merged image, to compute a vertical translation value for the merged image location under consideration;

adding the horizontal translation value to the horizontal image coordinate of the merged image location under consideration to establish a new horizontal image coordinate for the location; and

adding the vertical translation value to the vertical image coordinate of the merged image location under consideration to establish a new vertical image coordinate for the location.

24. The system of Claim 22, wherein the sub-module for generating periodic wave height values for each height map point at a given point in time, comprises a sub-module for generating a one-dimensional wave which simulates propagation only in the vertical direction from the top of the water region toward the bottom of the water region.

25. The system of Claim 24, wherein the sub-module for computing new image coordinates for each location in the water region of the merged image

that correspond to a height map point, comprises, for each such location, comprises sub-modules for:

subtracting the height value assigned to the height map for the merged image location to the left of the location under consideration from the height value assigned to the height map for the merged image location to the right of the location under consideration, and dividing the resulting difference by a scaling factor that relates the scale of the height map values to the merged image, to compute a horizontal translation value for the merged image location under consideration;

adding the height value assigned to the height map for the merged image location directly above the location under consideration to the periodic wave height value generated for the same location and associated with said given point in time to produce a combined upper neighbor height value;

adding the height value assigned to the height map for the merged image location immediately below the location under consideration to the periodic wave height value generated for the same location and associated with said given point in time to produce a combined lower neighbor height value;

subtracting the combined upper neighbor height value from the combined lower neighbor height value, and dividing the resulting difference by the scaling factor that relates the scale of the height map values to the merged image, to compute a vertical translation value for the merged image location under consideration;

adding the horizontal translation value to the horizontal image coordinate of the merged image location under consideration to establish a new horizontal image coordinate for the location; and

adding the vertical translation value to the vertical image coordinate of the merged image location under consideration to establish a new vertical image coordinate for the location.

26. The system of Claim 21, wherein the program module for generating a sequence of additional frames, comprises, for each new frame, sub-modules for:

computing a new height map for the frame being generated from the height map associated with the immediately preceding frame;

computing new image coordinates for each location in the water region of the frame being generated that correspond to a height map point using the new height map values associated with each of said locations; and

moving a pixel or pixels associated with each of said locations to the new image coordinates.

27. The system of Claim 26, wherein the sub-module for computing new image coordinates for each location in the water region of the frame being generated that correspond to a height map point, comprises, for each such location, comprises sub-modules for:

generating periodic wave height values for each height map point which simulate the shape and location of a wave on the surface of a body of water at a point in time corresponding to the frame being generated;

adding the height value assigned to the height map associated with the frame being generated for the location to the left of the location under consideration to the periodic wave height value generated for the same location and associated with the point in time corresponding to the frame being generated to produce a combined left-side neighbor height value;

adding the height value assigned to the height map associated with the frame being generated for the location to the right of the location under consideration to the periodic wave height value generated for the same location and associated with said point in time corresponding to the frame being generated to produce a combined right-side neighbor height value;

subtracting the combined left-side neighbor height value from the combined right-side neighbor height value, and dividing the resulting difference by a scaling factor that relates the scale of the height map values to the frame

being generated, to compute a horizontal translation value for the frame location under consideration;

adding the height value assigned to the height map for the location of the frame being generated directly above the location under consideration to the periodic wave height value generated for the same location and associated with said point in time corresponding to the frame being generated to produce a combined upper neighbor height value;

adding the height value assigned to the height map for the location of the frame being generated immediately below the location under consideration to the periodic wave height value generated for the same location and associated with said point in time corresponding to the frame being generated to produce a combined lower neighbor height value;

subtracting the combined upper neighbor height value from the combined lower neighbor height value, and dividing the resulting difference by the scaling factor that relates the scale of the height map values to the frame being generated, to compute a vertical translation value for the frame location under consideration;

adding the horizontal translation value to the horizontal image coordinate of the frame location under consideration to establish a new horizontal image coordinate for the location; and

adding the vertical translation value to the vertical image coordinate of the frame location under consideration to establish a new vertical image coordinate for the location.

28. A computer-readable medium having computer-executable instructions for generating a video having interactive water effects, said computer-executable instructions comprising:

inputting an image of a scene;

generating a reflection copy of at least a portion of the scene depicted in the input image to create a water region image;

merging the input image and water region image, and sizing the merged image to fit a desired frame size, to produce a first frame of the video;

distorting the water region portion of the merged image to simulate at least one ripple originating at a site selected by a viewer; and

generating a sequence of additional frames, each of which comprises a distorted version of the water region of the immediately preceding frame in which any ripple simulated in the immediately preceding frame is shown in a new location that simulates the natural motion of a ripple across a surface of a body of water.

29. A computer-implemented process for generating a video depicting water effects, comprising using a computer to perform the following process actions:

defining a orthogonal grid comprising a plurality of vertex points, said grid being sized to match a desired size of a water region in an overall scene depicted in each frame of the video;

inputting a texture map that is used in conjunction with a model of a scene to generate an image of the scene;

generating a reflection copy of the texture map and sizing it to match the overall size of the grid to create a water region texture map;

merging the input texture map and water region texture map to create a combined texture map, wherein the input texture map is sized to fit and associated with an upper portion of the video frames and the water region texture map is associated with a lower portion of the video frames, and wherein the water region texture map is inverted so that the water region of the video frames will appear to be an upside down image of the upper portion of the frames when rendered;

superimposing the grid on the water region texture map and associating each point of the grid with the closest water region texture map coordinate; and

rendering a sequence of video frames using a combined texture map, wherein each frame is rendered using a separate combined texture map whose associated grid's vertices, except for the first frame in the sequence, have been assigned height values which are at least initially derived from the immediately preceding frame in the sequence, and wherein the water region portion of the combined texture map associated with each frame in which water effects are to be depicted is distorted to simulate movement of the surface of the water in the water region of that frame using the height values assigned to its grid.

30. The process of Claim 29, wherein the process action of defining a orthogonal grid, comprises the actions of:

establishing the coordinates of the four corner vertices of the video frames;

specifying a height of a horizontal line which divides said upper and lower portions of the video frames;

specifying the number of equally-spaced horizontal grid lines and the number of equally-spaced vertical grid lines to be employed in the grid; and

identifying the grid coordinates of each vertex of the grid given the specified number of horizontal and vertical grid lines.

31. The process of Claim 30, wherein the process action of specifying the height of the horizontal line which divides said upper and lower portions of the video frames, comprises inputting a viewer-selected height value.

32. The process of Claim 30, wherein the process action of specifying the number of equally-spaced horizontal grid lines and the number of equally-spaced vertical grid lines to be employed in the grid, comprises inputting viewer-selected numbers for each.

33. The process of Claim 30, wherein the process action of specifying the number of equally-spaced horizontal grid lines and the number of equally-spaced vertical grid lines to be employed in the grid, comprises specifying a number of horizontal grid lines and a number of vertical grid lines which results in the spacing between the horizontal grid lines exceeding that of the vertical grid lines so as to create the appearance of perspective in the water region of the video frames being generated.

34. The process of Claim 29, wherein the overall scene in the rendered frames fill the entire frame, and wherein the frame size is made equal to the viewing portion of a screen of a display device being used by the viewer to view the video, such that a full screen video is produced.

35. The process of Claim 29, wherein the unit height of the height values assigned to a vertex of the grid associated with a combined texture map is scaled so that all height values are integer numbers.

36. The process of Claim 35, wherein the process action of rendering a sequence of video frames using a combined texture map, wherein each frame is rendered using a separate combined texture map whose associated grid's vertices, except for the first frame in the sequence, have been assigned height values which are at least initially derived from the immediately preceding frame in the sequence, comprises the actions of:

for each frame to be rendered, initially assigning height values to each vertex of the grid associated with the combined texture map for the frame under consideration by, using integer computation,

summing the height values assigned to vertices in the grid associated with the immediately preceding frame's combined texture map which are directly above and below, and directly to the left and to the right, of the location of the vertex under consideration, wherein for the first frame in the

sequence it is assumed all the height values associated with the immediately preceding frame are equal to zero,

dividing the height value sum by two to compute a height value quotient,

subtracting the height value assigned to the vertex location under consideration in the grid associated with the texture map of the immediately preceding frame from the computed height value quotient to computed a height value for the vertex under consideration; and

assigning the computed height value to the grid vertex under consideration.

37. The process of Claim 36, wherein the process action of initially assigning height values to each vertex of the grid associated with the combined texture map for each frame to be rendered subsequent to the first frame, further comprises, prior to assigning the new height value to each grid vertex under consideration, an action of applying a damping factor to the computed height value to produce a damped height value, wherein the application of the damping factor reduces the computed height value to simulate a smoothing out of the ripple or ripples over time, and assigning the damped height value as the computed height value to the grid vertex under consideration.

38. The process of Claim 37, wherein the process action of applying the damping factor, comprises the action of:

multiplying the computed height value by a damping factor to produce a damping value; and

subtracting the damping value from the computed height value to produce said damped height value.

39. The process of Claim 38, wherein the damping factor is selected by the viewer.

40. The process of Claim 36, wherein the process action of rendering frames having a water region portion of the combined texture map associated therewith which is distorted, comprises an action of distorting the water region portion of the combined texture map to simulate at least one ripple originating at a site selected by a viewer.

41. The process of Claim 40, wherein the process action of distorting the water region portion of the combined texture map to simulate at least one ripple, comprises the process actions of:

displaying a frame of the video to the viewer and inputting the location of each site selected by the viewer in the water region of the displayed frame;

imposing a ripple mask onto the grid associated with the combined texture map of the next frame to be rendered in the sequence of frames by modifying the initially assigned height values of the vertices thereof corresponding to each viewer-selected location, as well vertices corresponding to frame locations adjoining the viewer-selected locations; and

for each vertex of the grid associated with the combined texture map of the next frame to be rendered,

using the currently assigned height values of neighboring vertices to identify the grid coordinates of a different one of the grid vertices; and

assigning the texture coordinates associated with the identified vertex to the vertex under consideration in lieu of the previously assigned texture coordinates.

42. The process of Claim 41, wherein the process action of imposing a ripple mask onto the grid associated with the combined texture map of the next frame to be rendered, comprises, for each viewer-selected location, the actions of:

adding an integer height value representing a ripple amplitude of the ripple being simulated to the existing height value assigned to the vertex

corresponding to the texture map coordinates associated with the viewer-selected location;

adding an integer height value representing one-half of the ripple amplitude to the assigned height values of vertices corresponding to the texture map coordinates associated with frame locations above, below, to the right and to the left of the viewer-selected location; and

adding an integer height value representing one-quarter of the ripple amplitude to the assigned height values of vertices corresponding to the texture map coordinates associated with frame locations directly diagonal to the viewer-selected location.

43. The process of Claim 42, wherein the integer height value associated with the ripple amplitude is selected by the viewer for each viewer-selected frame location.

44. The process of Claim 41, wherein the process action of using the currently assigned height values of neighboring vertices to identify the grid coordinates of a different one of the grid vertices for each vertex of the grid associated with the combined texture map of the next frame to be rendered, comprises the process actions of:

subtracting the height value assigned to the vertex to the left of the vertex under consideration from the height value assigned to the vertex to the right of the vertex under consideration, to compute a horizontal difference value for the vertex under consideration;

subtracting the height value assigned to the vertex directly above the vertex under consideration from the height value assigned to the vertex immediately below the vertex under consideration, to compute a vertical difference value for the vertex under consideration;

adding the horizontal difference value to the horizontal grid coordinate of the vertex under consideration to establish the horizontal grid coordinate of said different one of the grid vertices; and

adding the vertical difference value to the vertical grid coordinate of the vertex under consideration to establish the vertical grid coordinate of said different one of the grid vertices.

45. The process of Claim 36, wherein the process action of rendering frames having a water region portion of the combined texture map associated therewith which is distorted, comprises an action of distorting the water region portion of the combined texture map to simulate a periodic wave.

46. The process of Claim 45, wherein the program module for distorting the water region portion of the merged image to simulate a periodic wave, comprises the actions of:

generating integer periodic wave height values for each grid vertex location associated with each combined texture map of each frame in the sequence of frames, wherein each set of periodic wave height values associated with the grid of a texture map simulates the shape and location of a wave on the surface of a body of water at a point in time corresponding to the order in which the frame generated using the texture map is scheduled to be played;

for each vertex of the grid associated with the combined texture map of the next frame to be rendered,

using the currently assigned height values of neighboring vertices and the periodic wave height values associated with those vertices to identify the grid coordinates of a different one of the grid vertices; and

assigning the texture coordinates associated with the identified vertex to the vertex under consideration in lieu of the previously assigned texture coordinates.

47. The process of Claim 46, wherein the process action of using the currently assigned height values of neighboring vertices and the periodic wave height values associated with those vertices to identify the grid coordinates of a different one of the grid vertices for each vertex of the grid associated with the

combined texture map of the next frame to be rendered, comprises the process actions of:

adding the height value assigned to the vertex to the left of the vertex under consideration to the periodic wave height value generated for the same location of grid of the texture map for the frame being generated to produce a combined left-side neighbor height value;

adding the height value assigned to the vertex to the right of the vertex under consideration to the periodic wave height value generated for the same location of grid of the texture map for the frame being generated to produce a combined right-side neighbor height value;

subtracting the combined left-side neighbor height value from the combined right-side neighbor height value, to compute a horizontal difference value for the vertex under consideration;

adding the height value assigned to the vertex directly above the vertex under consideration to the periodic wave height value generated for the same location of grid of the texture map for the frame being generated to produce a combined upper neighbor height value;

adding the height value assigned to the vertex immediately below the vertex under consideration to the periodic wave height value generated for the same location of grid of the texture map for the frame being generated to produce a combined lower neighbor height value;

subtracting the combined upper neighbor height value from the combined lower neighbor height value, to compute a vertical difference value for the vertex under consideration;

adding the horizontal difference value to the horizontal grid coordinate of the vertex under consideration to establish the horizontal grid coordinate of said different one of the grid vertices; and

adding the vertical difference value to the vertical grid coordinate of the vertex under consideration to establish the vertical grid coordinate of said different one of the grid vertices.